

Quarter 1 Test 2 Review Key

$$1) \frac{8a^2 - 8ab}{16a^3 - 16a^2b} = \frac{8a(a-b)}{16a^2(a-b)} = \boxed{\frac{1}{2a}} \quad \text{Restrictions } a \neq 0, b$$

$$2) \frac{6k^2 - 30k}{15 + 7k - 2k^2} = \frac{6k(k-5)}{-1(2k^2 - 7k - 15)} = \frac{6k(k-5)}{-1(2k+3)(k-5)} = \boxed{\frac{6k}{-1(2k+3)}} \quad \text{Restrictions } k \neq -\frac{3}{2}, 5$$

$$3) \frac{4h^2}{h^2 - h} = \frac{4h^2}{h(h-1)} = \boxed{\frac{4h}{h-1}} \quad \text{Restrictions } h \neq 0, 1$$

$$4) \frac{x^2y + xy^2}{x^3 - 4x^2y} \cdot \frac{xy - 4y^2}{xy^2 + 2y^3} = \frac{\cancel{xy}(x+y)}{\cancel{x^2}(x-4y)} \cdot \frac{\cancel{y}(x-4y)}{\cancel{y^2}(x+2y)} = \boxed{\frac{x+y}{x(x+2y)}} \quad \text{Restrictions } x \neq 0, -2y, 4y, y \neq 0$$

$$5) \frac{a^2 - ab}{ab + 2b^3} \div \frac{a^2 + ab}{ab + b^2} = \frac{a(a-b)}{b(a+2b^2)} \cdot \frac{b(a+b)}{a(a+b)} = \boxed{\frac{a-b}{a+2b^2}} \quad \text{Restrictions: } a \neq 0, -b, -2b^2, b \neq 0$$

$$6) \frac{21x^2 + 10x + 1}{16x^2 + 8x - 15} \div \frac{21x^2 - 11x - 2}{20x^2 + x - 12} = \frac{(3x+1)(7x+1)}{(4x-3)(4x+5)} \cdot \frac{(4x-3)(5x+4)}{(7x+1)(3x-2)} = \boxed{\frac{(3x+1)(5x+4)}{(4x+5)(3x-2)}} \quad \text{Restrictions: } x \neq \frac{3}{4}, -\frac{5}{4}, -\frac{1}{7}, \frac{2}{3}, -\frac{4}{5}$$

$$7) \frac{4y^2 - 21y - 18}{3y^2 + 31y + 56} \cdot \frac{3y^2 - 5y - 28}{2y^2 - 15y + 18} \div \frac{3y^2 - 17y + 20}{2y^2 + 16y - 24} = \frac{(y-6)(4y+3)}{(y+8)(3y+7)} \cdot \frac{(y-4)(3y+7)}{(y-6)(2y-3)} \cdot \frac{(y+8)(2y-3)}{(y-4)(3y-5)} = \boxed{\frac{4y+3}{3y-5}} \quad \text{Restrictions: } y \neq -8, -\frac{7}{3}, 6, \frac{3}{2}, 4, \frac{5}{3}$$

$$8) \frac{y-3}{y^2+3y-4} + \frac{2y+1}{2y^2+6y-8} = \frac{2(y-3)}{2(y^2+3y-4)} + \frac{2y+1}{2(y^2+3y-4)} = \frac{2y-6+2y+1}{2(y^2+3y-4)} = \boxed{\frac{4y-5}{2(y^2+3y-4)}}$$

Restrictions: $y \neq -4, 1$

$$9) \frac{y}{y+2} - \frac{2}{3-y} - \frac{3y+1}{y^2-y-6} = \frac{y(y-3)}{(y-3)(y+2)} + \frac{2(y+2)}{(y-3)(y+2)} - \frac{3y+1}{(y-3)(y+2)} = \frac{y^2-3y+2y+4-3y-1}{(y-3)(y+2)}$$

LCD: $(y+2)(y-3)$

Restrictions: $y \neq 3, -2$

$$= \frac{y^2-4y+3}{(y-3)(y+2)} = \frac{(y-3)(y-1)}{(y-3)(y+2)} = \boxed{\frac{y-1}{y+2}}$$

$$10) (6xwz) \frac{2}{x} - \frac{1}{2z} (6xwz) = \boxed{\frac{12wz - 3xw}{18xz - 2xw}} = \frac{3w(4z-x)}{2x(9z-w)}$$

Restrictions: $x \neq 0, w \neq 0, 9z \neq w$

LCD: $(6xwz) \frac{3}{w} - \frac{1}{3z} (6xwz)$

$$11) \frac{4-x^{-2}}{2x^{-1}-x^{-2}} = \frac{(x^2)4 - \frac{1}{x^2}(x^2)}{(x^2)\frac{2}{x} - \frac{1}{x^2}(x^2)} \quad \text{LCD} = x^2 = \frac{4x^2-1}{2x-1} = \frac{(2x-1)(2x+1)}{(2x-1)} = \boxed{2x+1}$$

Restrictions: $x \neq 0, \frac{1}{2}$

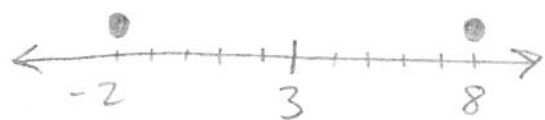
$$12) \frac{1 - \frac{1}{1-x}}{16 + \frac{7}{x^2-1}} = \frac{\frac{(x+1)(x-1)}{(x+1)(x-1)} + \frac{1}{x-1}}{\frac{(x+1)(x-1)}{16} + \frac{7}{(x+1)(x-1)}} \quad \text{LCD} = (x+1)(x-1)$$

$$= \frac{x^2-1+x+1}{16x^2-16+7} = \boxed{\frac{x^2+x}{16x^2-9}}$$

$$= \frac{x(x+1)}{(4x-3)(4x+3)}$$

Restrictions: $x \neq \pm 1, \pm \frac{3}{4}$

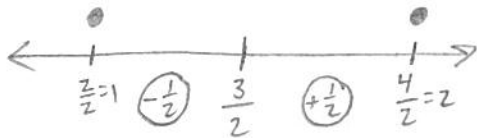
$$13) |x-3|=5 \quad x\text{'s distance from 3 is 5}$$



$$\{-2, 8\}$$

$$14) \left| \frac{2x-3}{2} \right| = \frac{1}{2}$$

$$\left| x - \frac{3}{2} \right| = \frac{1}{2} \quad x\text{'s distance from } \frac{3}{2} \text{ is } \frac{1}{2}$$

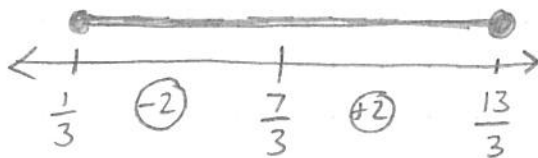


$$\{1, 2\}$$

$$15) |7-3x| \leq 6$$

$$\left| \frac{3x-7}{3} \right| \leq \frac{6}{3}$$

$$\left| x - \frac{7}{3} \right| \leq 2 \quad x\text{'s distance from } \frac{7}{3} \text{ is less than or equal to } 2$$



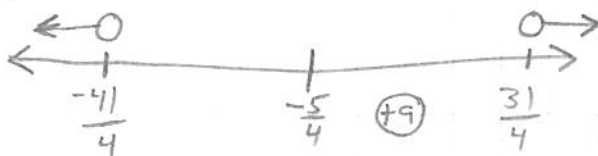
$$SB: \{x \mid \frac{1}{3} \leq x \leq \frac{13}{3}\} \quad Int: \left[\frac{1}{3}, \frac{13}{3} \right]$$

$$16) \left| \frac{5}{6} + \frac{2}{3}x \right| > 6$$

$$\left| \frac{2}{3}x + \frac{5}{6} \right| > 6$$

$$\left| \left(\frac{2}{3} \right) \frac{3}{2}x + \frac{5}{6} \left(\frac{3}{2} \right) \right| > 6 \left(\frac{3}{2} \right)$$

$$\left| x + \frac{5}{4} \right| > 9 \quad x\text{'s distance from } -\frac{5}{4} \text{ is greater than } 9$$



$$SB: \{x \mid x < -\frac{41}{4} \vee x > \frac{31}{4}\}$$

$$Int: (-\infty, -\frac{41}{4}) \cup (\frac{31}{4}, \infty)$$